

Enhanced Delta Smelt Monitoring

Preliminary Abundance Analysis

Phase 3 Sampling

DRAFT

U.S. Fish and Wildlife Service

July 14, 2017

Overview

Beginning July 2017, the Enhanced Delta Smelt Monitoring (EDSM) program started its Phase 3 sampling program. The Bay-Delta has been divided into eight geographic strata:

- Western Delta
- Suisun Bay Marsh (Suisun Bay and Marsh)
- Lower Sacramento
- Cache Slough LI (Cache Slough and Liberty Island)
- Sac DW Ship Channel (Sacramento Deep Water Shipping Channel)
- Upper Sacramento
- Lower San Joaquin
- Southern Delta

Sampling locations are generated using a generalized random-tessellation stratified (GRTS) design [1] with stratification and equal probability sampling. Trawling gear similar to that used in the California Department of Fish and Wildlife's [Spring Kodiak Trawl Survey](#) is used to conduct multiple tows per location.

Everything presented here is preliminary and subject to correction, revision, and improvement. The following points should be taken into consideration when interpreting the results:

1. Delta smelt caught in the wings of the net (as opposed to the live box or cod end) were excluded from this analysis. Fish caught in the wings are indicated by a Gear Condition Code of 9.
2. The **Week** designations used here were defined out of convenience and are subject to change.
3. Current sampling is limited to areas of the Bay-Delta with a depth of at least 8 feet at mean tide. The abundance estimation method used here assumes that the density of fish in unsampled areas (i.e., those with depth less than 8 feet) is the same as in sampled areas (i.e., those with depth greater than or equal to 8 feet).
4. The methods of analysis used here remain in development.

Change Log

Report date July 10, 2017:

- No changes.

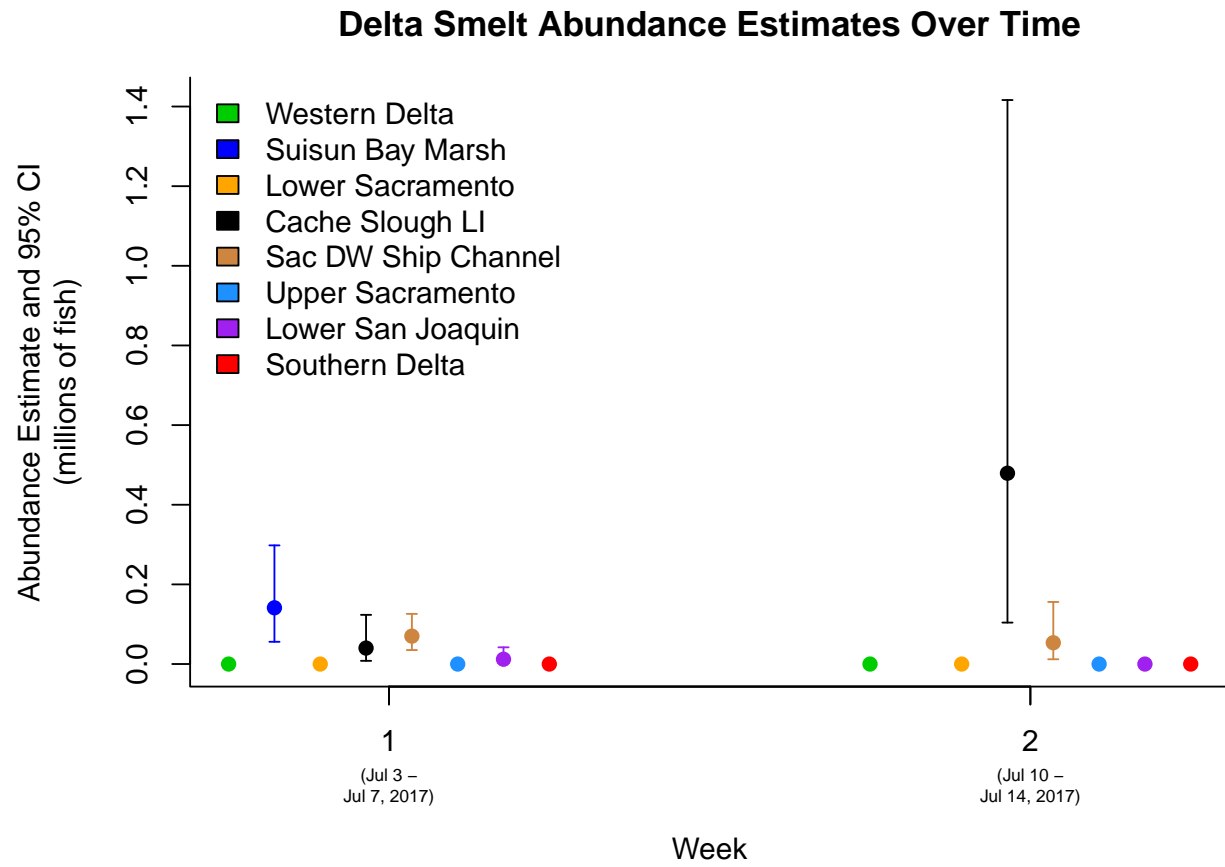
Report date July 14, 2017:

- Sample volume corrections were made for tows in Suisun Bay Marsh during Week 1. This resulted in an increase in the abundance estimate for that week.

Results

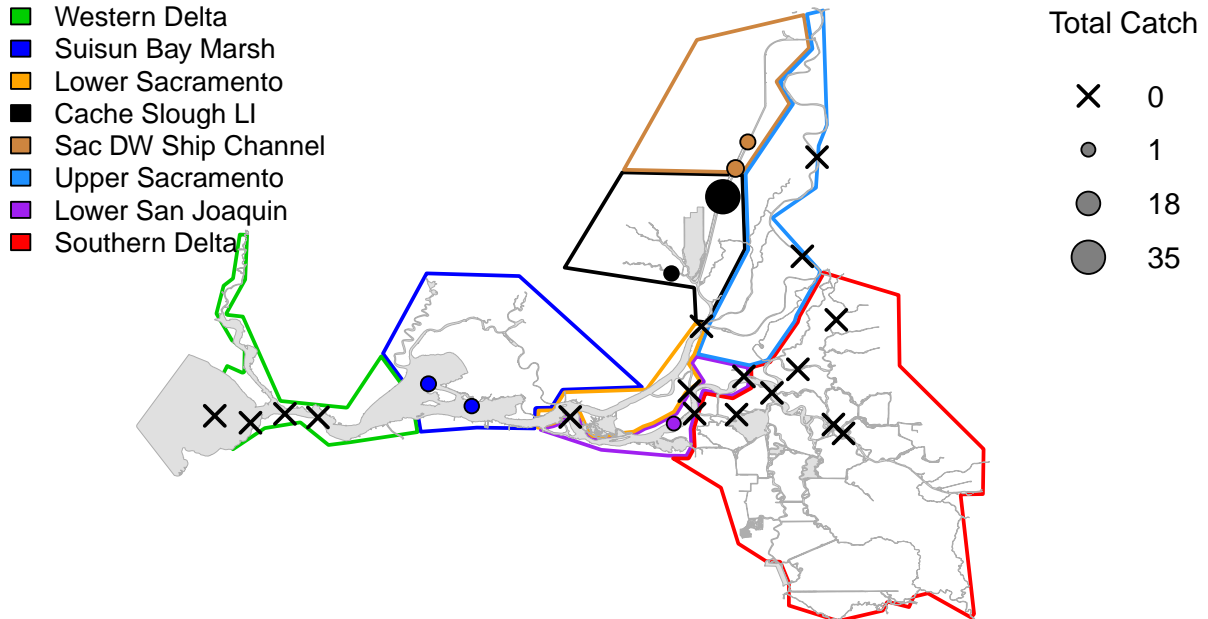
Table 1: Delta smelt catch summary and abundance estimates by week. An asterisk (*) is used to emphasize weeks when no delta smelt were caught and a dash (-) is used to indicate that sampling did not occur or that a quantity could not be calculated. In order to avoid confusion, weekly totals are currently only calculated when sampling has occurred in every stratum.

Stratum	Number of Sites	Number of Tows	Number Caught	Estimate and 95% CI			
				Abundance	Lower Bound	Upper Bound	
Week 1: July 3 - July 7, 2017							
Western Delta	4	32	0	0*	-	-	
Suisun Bay Marsh	2	5	5	141,293	55,832	297,925	
Lower Sacramento	2	10	0	0*	-	-	
Cache Slough LI	2	3	37	40,101	7,998	123,480	
Sac DW Ship Channel	2	4	9	70,077	35,057	125,938	
Upper Sacramento	2	13	0	0*	-	-	
Lower San Joaquin	4	20	1	12,091	1,845	41,979	
Southern Delta	6	48	0	0*	-	-	
Total	24	135	52	263,562	146,216	439,125	
Week 2: July 10 - July 14, 2017							
Western Delta	2	12	0	0*	-	-	
Suisun Bay Marsh	0	-	-	-	-	-	
Lower Sacramento	2	10	0	0*	-	-	
Cache Slough LI	2	7	25	479,200	104,033	1,416,325	
Sac DW Ship Channel	2	7	7	53,507	11,959	155,885	
Upper Sacramento	2	16	0	0*	-	-	
Lower San Joaquin	4	20	0	0*	-	-	
Southern Delta	6	48	0	0*	-	-	
Total	20	120	32	-	-	-	

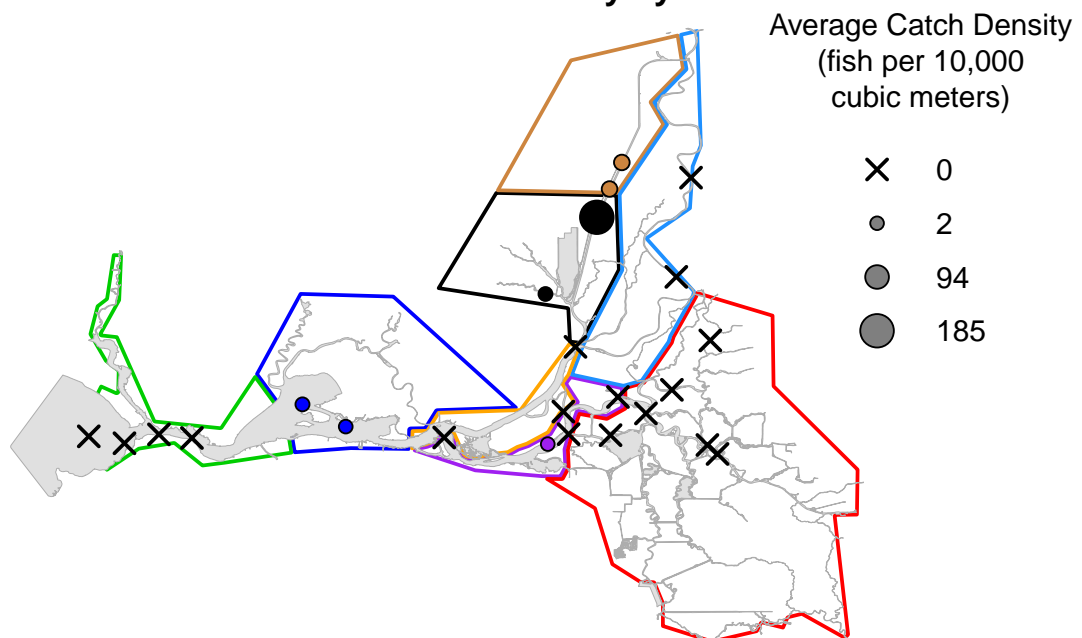


Week 1 (Jul 3 – Jul 7, 2017)

Delta Smelt Total Catch by Site

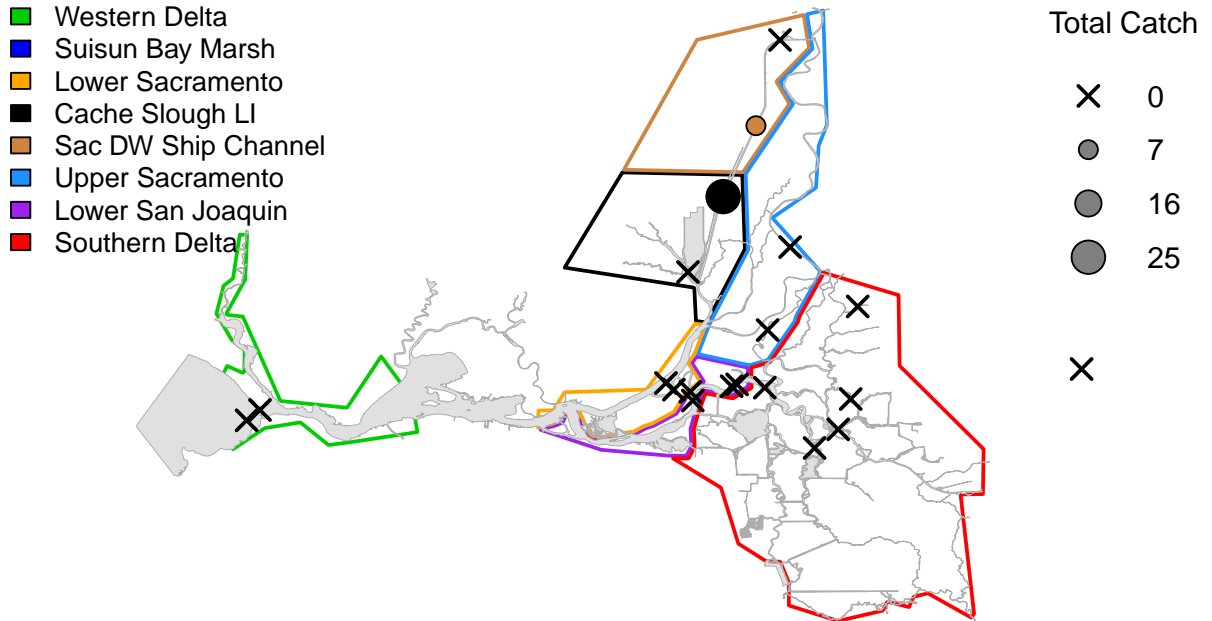


Delta Smelt Catch Density by Site

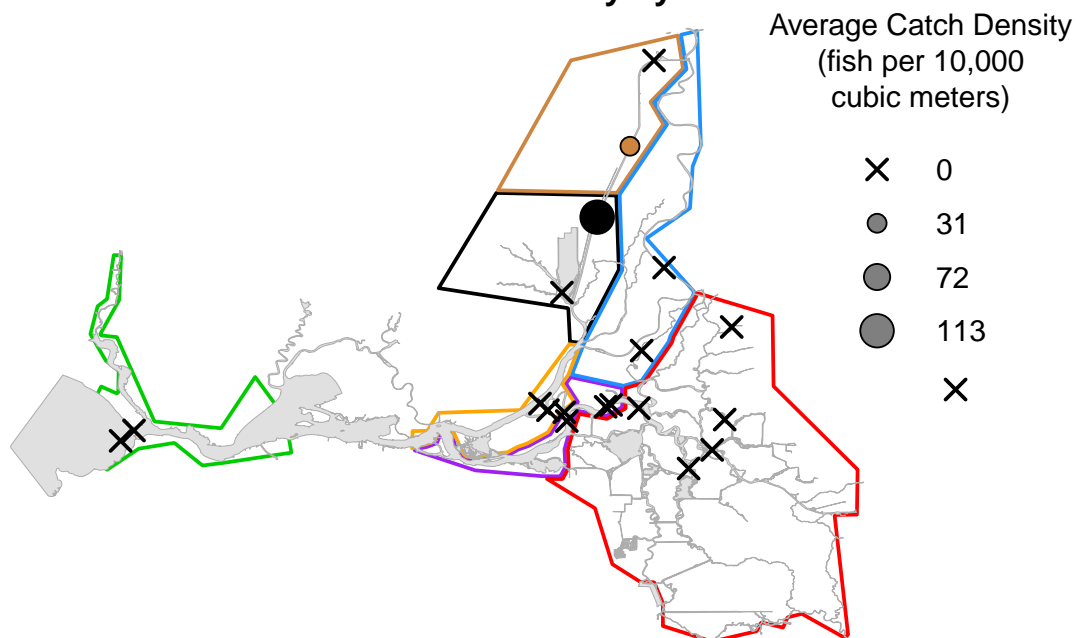


Week 2 (Jul 10 – Jul 14, 2017)

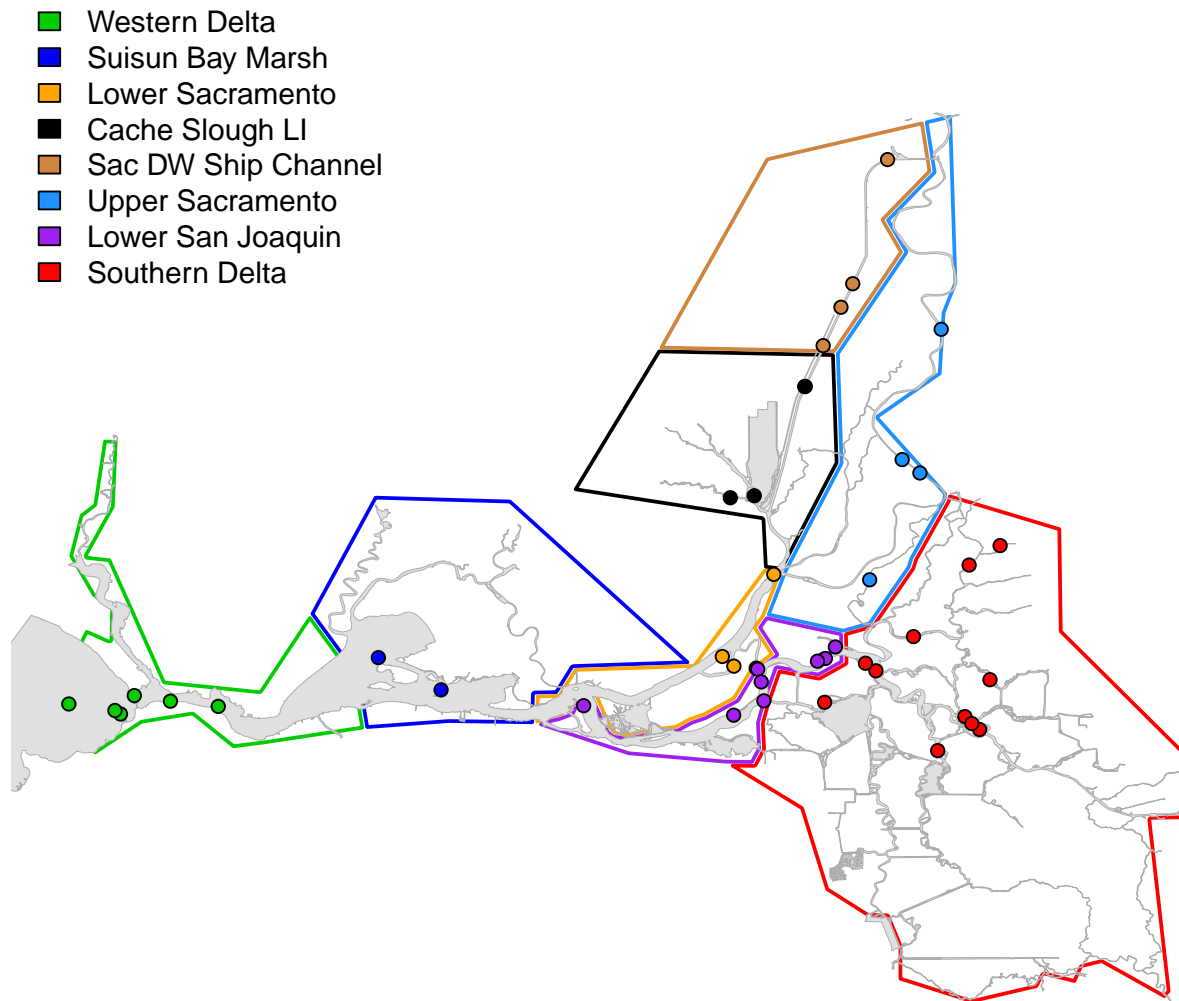
Delta Smelt Total Catch by Site



Delta Smelt Catch Density by Site



All Sampling Locations To Date



References

- [1] Stevens, Don L., Olsen, Anthony R. 2004. Spatially balanced sampling of natural resources, *Journal of the American Statistical Association*, 99(465): 262 – 278.